SCAN OPTICS

SO-5800
MICROSCOPE

ASSEMBLY MANUAL

CONTENTS

FIGURES

INTRODUCTION

Please read the following information carefully before installing and using the Scan Optics SO-5800 Ophthalmic microscope. Scan Optics is responsible for the safety, reliability and performance of the equipment only if it is used in accordance with these instructions.

This microscope is designed for use by a certified practitioner, for magnified observation of patients, and for use in an operating theatre as an observation aid during surgery.

Environmental storage and packing conditions of 60-95% relative humidity and 10-40 °C, are recommended for this product.

No parts or accessories supplied with this microscope are supplied in a sterile condition.

Apart from those instructions within this manual, there are no user-serviceable parts in this microscope. Scan Optics will retain the discretion to advise whether any repairs may be taken out by external qualified technical personnel, or whether part(s) of the microscope must be returned to the manufacturer's premises for service or repairs to be carried out under warranty or otherwise. Where appropriately qualified technical personnel are identified by a user, and ratified by Scan Optics, then Scan Optics will make available on request any information which will assist in repairing the equipment.

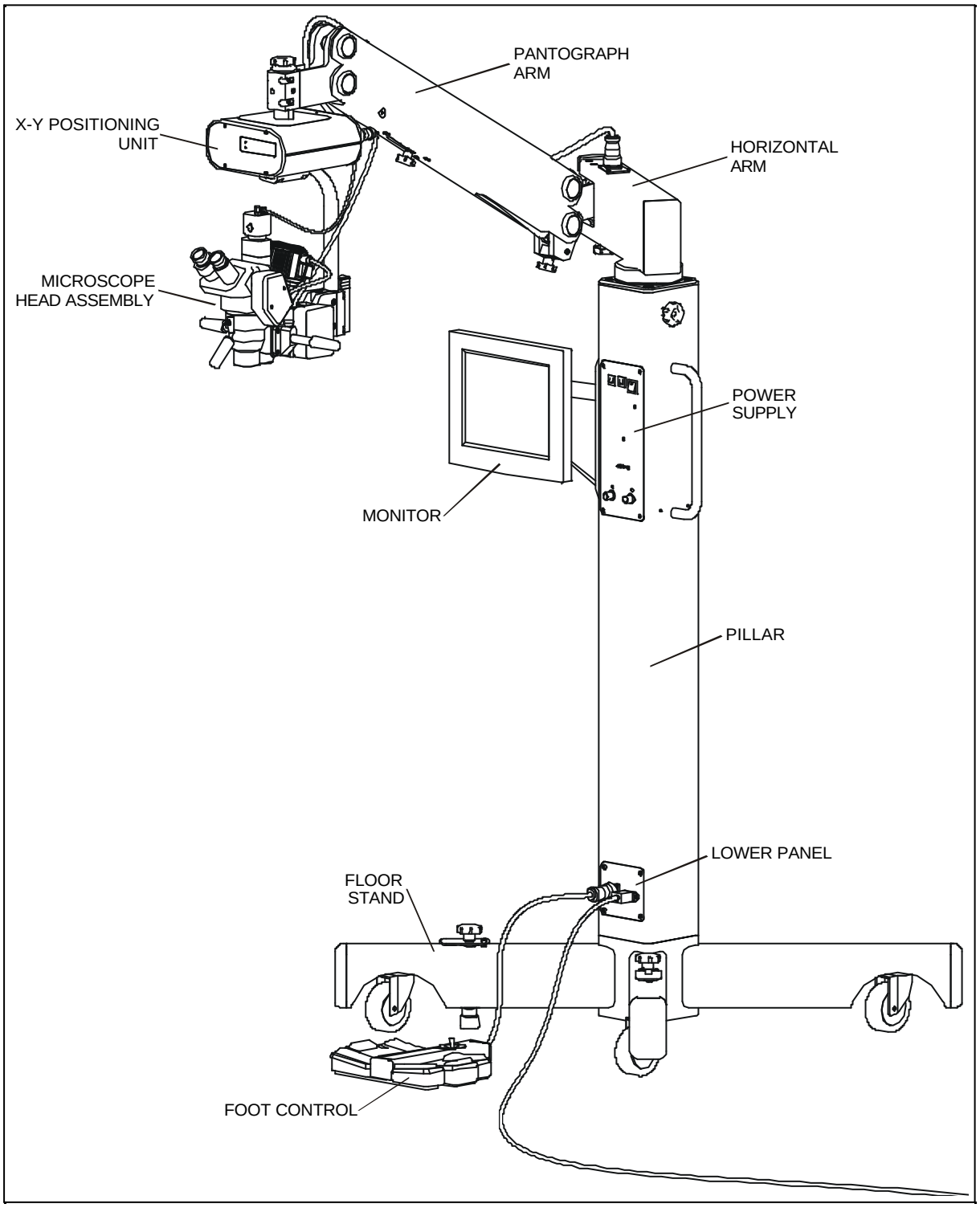

Figure A-1: SO-5800 Microscope

PACKING LIST

Assembly Manual (this manual)
User Manual
Pillar and horizontal arm assembly, with mounting screws (M10x25) x 4
(includes power supply)
Pantograph arm assembly
(includes main power cable and video signal cable)
Suspension bracket (with mounting screws) with attached
spare lamp module
Monitor arm assembly
Floor stand legs (2 interlocking)
Floor stand joiners (top and bottom), with 4 mounting screws
Box 1: Microscope head assembly
Box 2: X-Y unit with top bearing and knob
Box 3: Monitor with mounting bracket in original packaging
including: Box Video Accessories including:
Monitor power cable
Monitor remote control
Video camera assembly
Video camera power cable
Box 4: Binocular assistant microscope assembly
Box 5: Accessories:
Mains cable
Set sterilisable knob covers
(6 x 'zoom', 2 x 'focus', 6 x 'handle')
Microscope cover
Tool box including:
eyepieces x 2, lens cloth
Set socket keys: 9 total; 1.5 - 10 mm
Arm bearing mounts x 2 with 8 mounting screws
and friction washer
Elbow lock knob
Microscope side handles with locking pins x2
Microscope front handle with mounting screw
Box 6: Foot control

MECHANICAL ASSEMBLY

NOTE: MINIMUM 2 PERSONS REQUIRED

Floor stand base and pillar: refer figures A-2 to A-5

1. Remove the floor stand base from the crate

2. Place the top joiner upside-down on the floor and insert the upper and lower interlocking legs as shown

3. Place the bottom joiner over the crossed legs and fix the assembly together using the four M8x70 socket head cap screws and 6 mm socket key provided. Tighten the screws alternately to ensure even pressure is applied and that the assembly is seated square and true.

4. The floor stand base is now assembled but upside-down. Place the floor stand base the right way up on the floor and lock the two wheel stops by applying foot pressure.

5. Unpack the pillar/horizontal arm assembly from the crate and remove the four M10 x 25 socket head cap screws and washers from the pillar legs.

6. Insert the pillar pins into the floor stand base holes so that the front panel faces out in between the legs with wheel locks. Unlock the horizontal arm and rotate it until it is in line with the front panel. Then lock it in to place again.

7. **Take care with the next step:**
   Use the side handles to carefully lean the pillar and base back, then carefully chock up the elevated end. While one person holds the pillar flush against the base, the other can insert the four M10 x 25 socket head cap screws and washers from underneath the floor stand base assembly into the threaded holes in the end of the pillar pins. Tighten alternately with the 8 mm socket key until secure. The entire assembly may now be placed back upright on the floor.

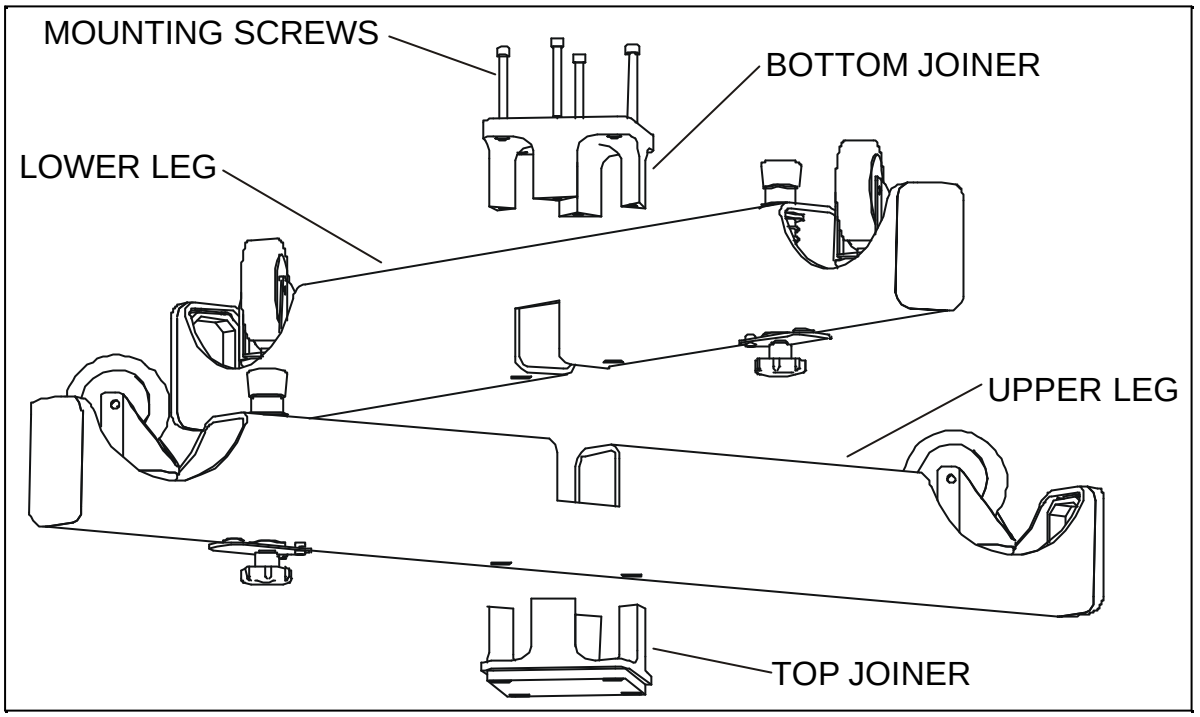

Figure A-2: Assembling the floor stand base

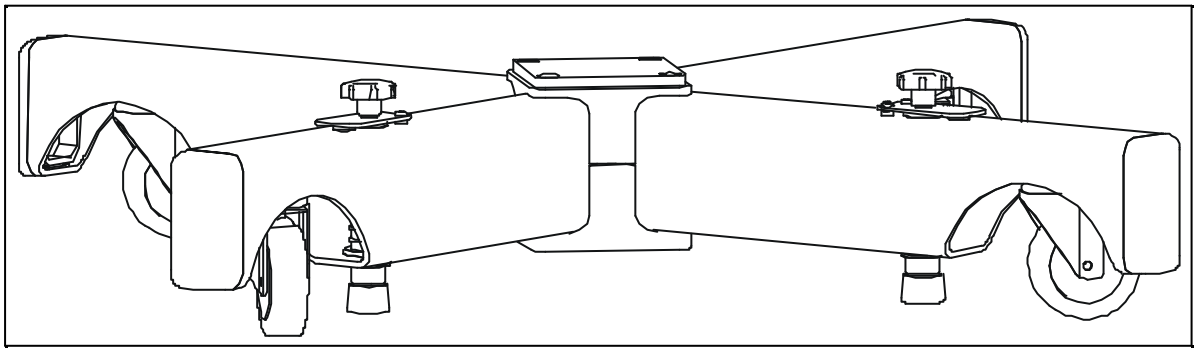

Figure A-3: Assembled floor stand base

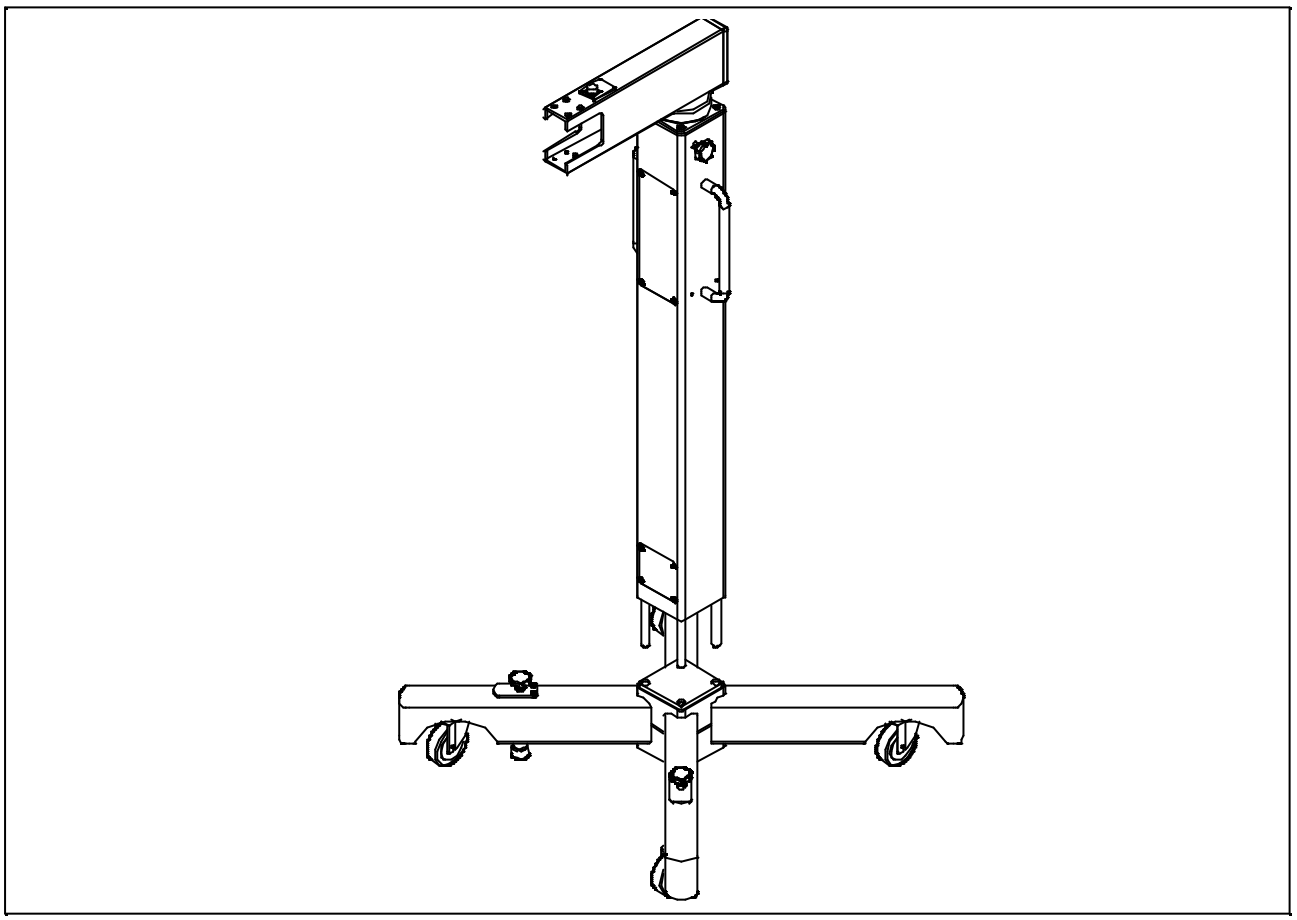

Figure A-4: Inserting the pillar in the floor stand base

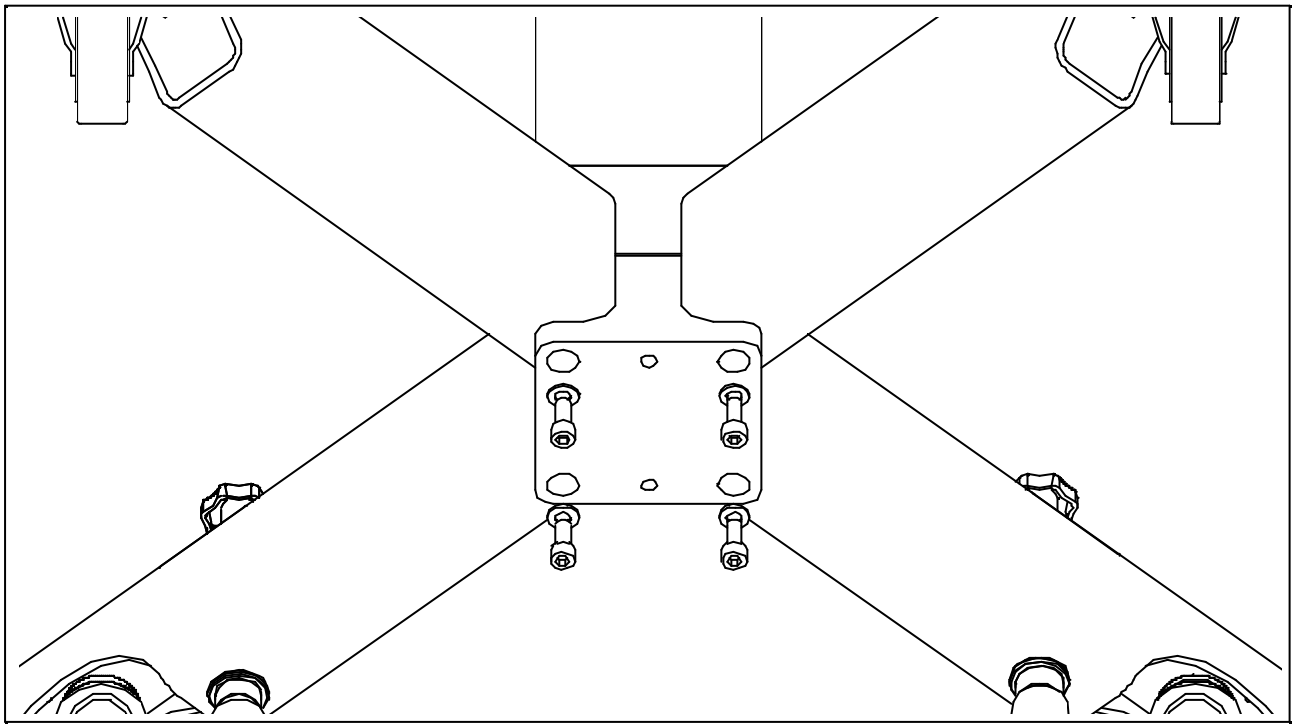

Figure A-5: Fixing the pillar to the floor stand base

Pantograph arm: refer figures A-6 and A-7

1. Identify and remove the arm bearing mounts from the box.
   Remove the pantograph arm assembly from the crate. Place the friction washer over the top exposed shaft at one end of the pantograph arm. The top side may be identified as the plain side; the bottom side features the sliding knob safety stop assembly.
   Place the arm bearing mounts in their correct orientation over the ends of the shaft on the pantograph arm. Note that the lower arm bearing mount must be supported by hand from underneath to prevent it dropping down.
   With the arm bearing mounts in place insert the pantograph arm in to the end of the horizontal arm assembly. Note that some shuffling movement will help to move the arm in to place. When the arm bearing mounts are flush against the horizontal arm, insert the 8 M6 x 16 countersunk screws and tighten them alternately using the 4 mm socket key.

2. Identify and remove the elbow lock knob from the box. Screw the knob in underneath the end of the horizontal arm.

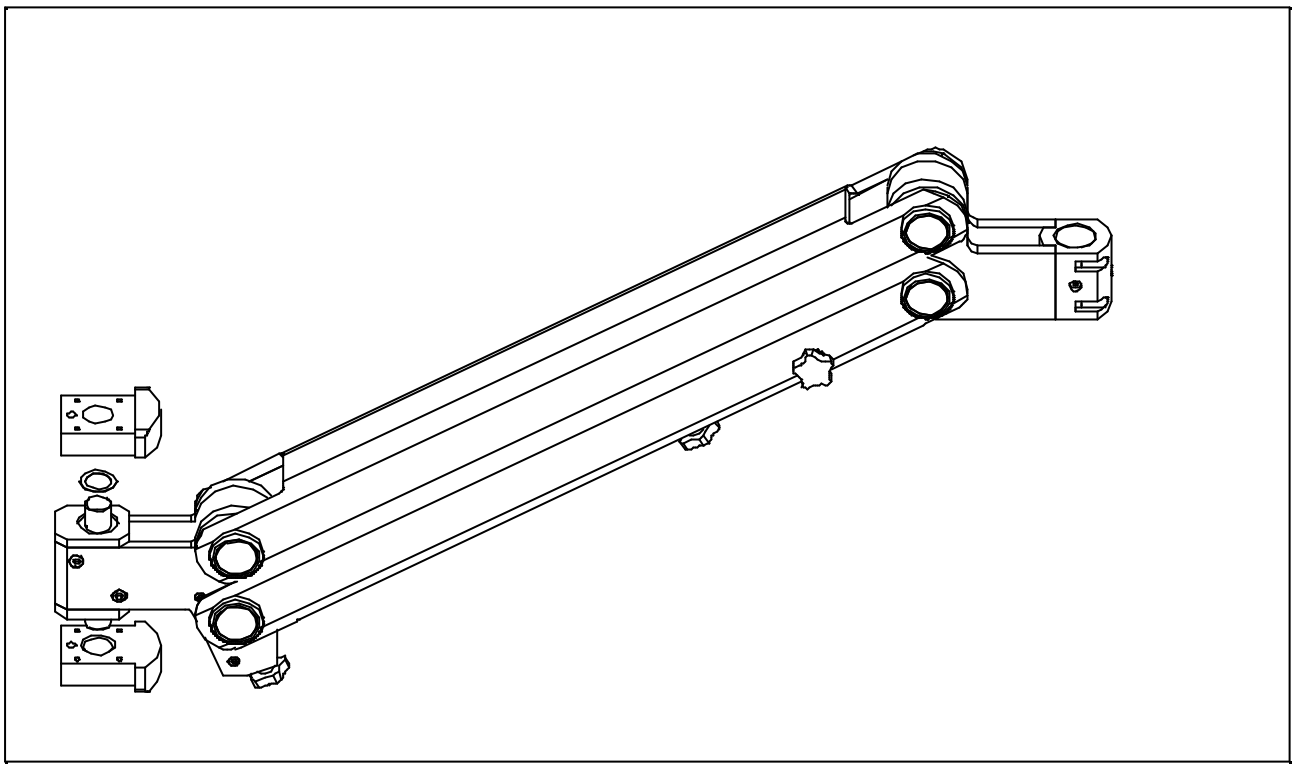

Figure A-6: Placing the friction washer and arm bearing mounts

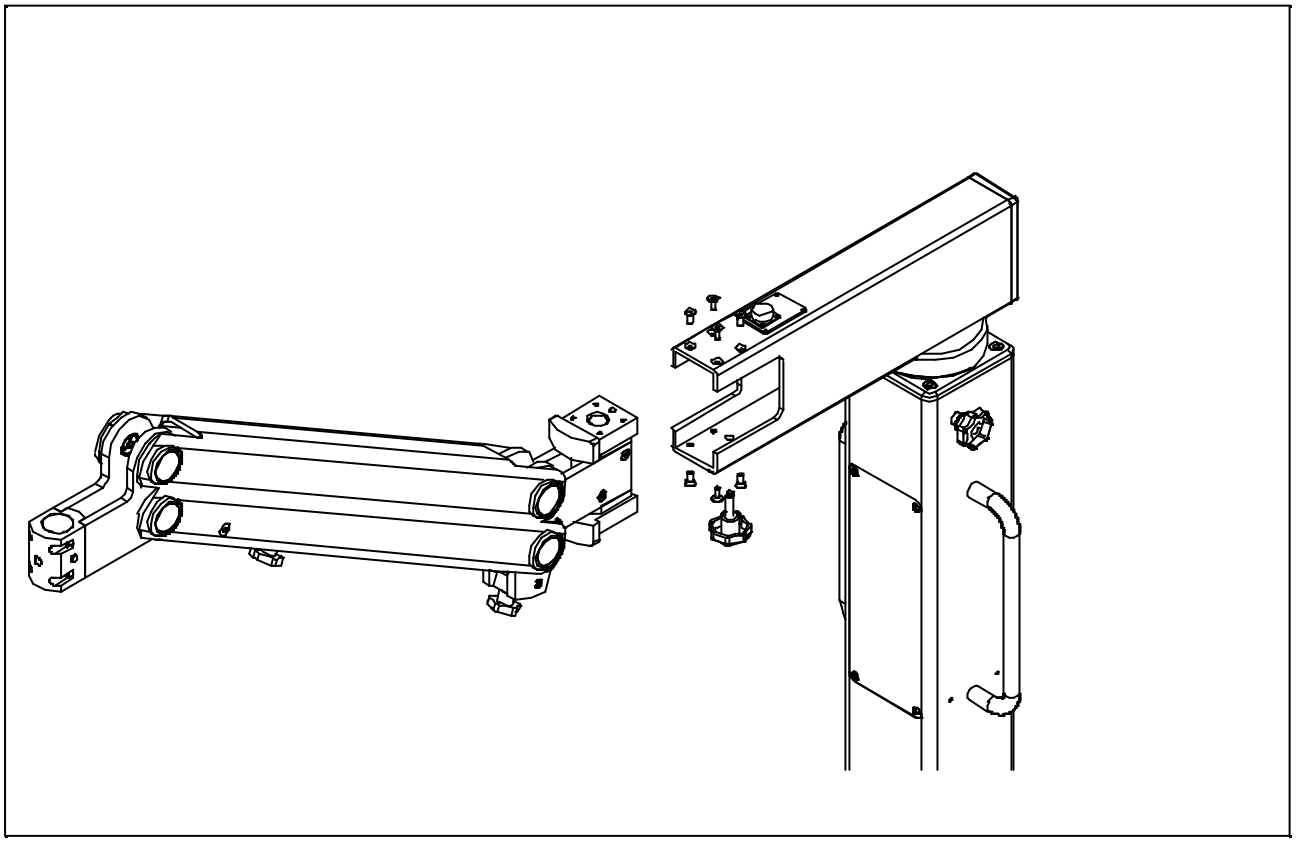

Figure A-7: Attaching the pantograph arm

X-Y Unit: refer figure A-8

1. Identify and remove the X-Y unit from the box. Remove the top bearing and knob assembly from the X-Y unit by unscrewing the knob. Make sure that the set of washers remains inside the counter bore in the top bearing.

2. **This important safety step is crucial:**
   Lower the pantograph arm so that the shaft of the X-Y unit may be inserted from underneath the conical bearing surface at the free end of the pantograph arm. Support the X-Y unit from underneath and hold it firm against the bearing surface. Tighten the 3 M6 x 12 safety screws (which are already in place) located at the end of the arm using the 5 mm socket key. *While holding the X-Y unit*, check that the safety screws are functioning by demonstrating that the X-Y unit will not drop to the floor when support from underneath is removed.

3. Place the top bearing over the shaft of the X-Y unit from above the pantograph arm, ensuring that the slot locates on the transverse pin in the shaft, and that the friction washers are in place. Then screw the knob up on the shaft to set the friction for rotational movement of the X-Y unit. Rotate the X-Y unit until the front panel (identified by the Scan Optics label) faces out in line with the pantograph arm.

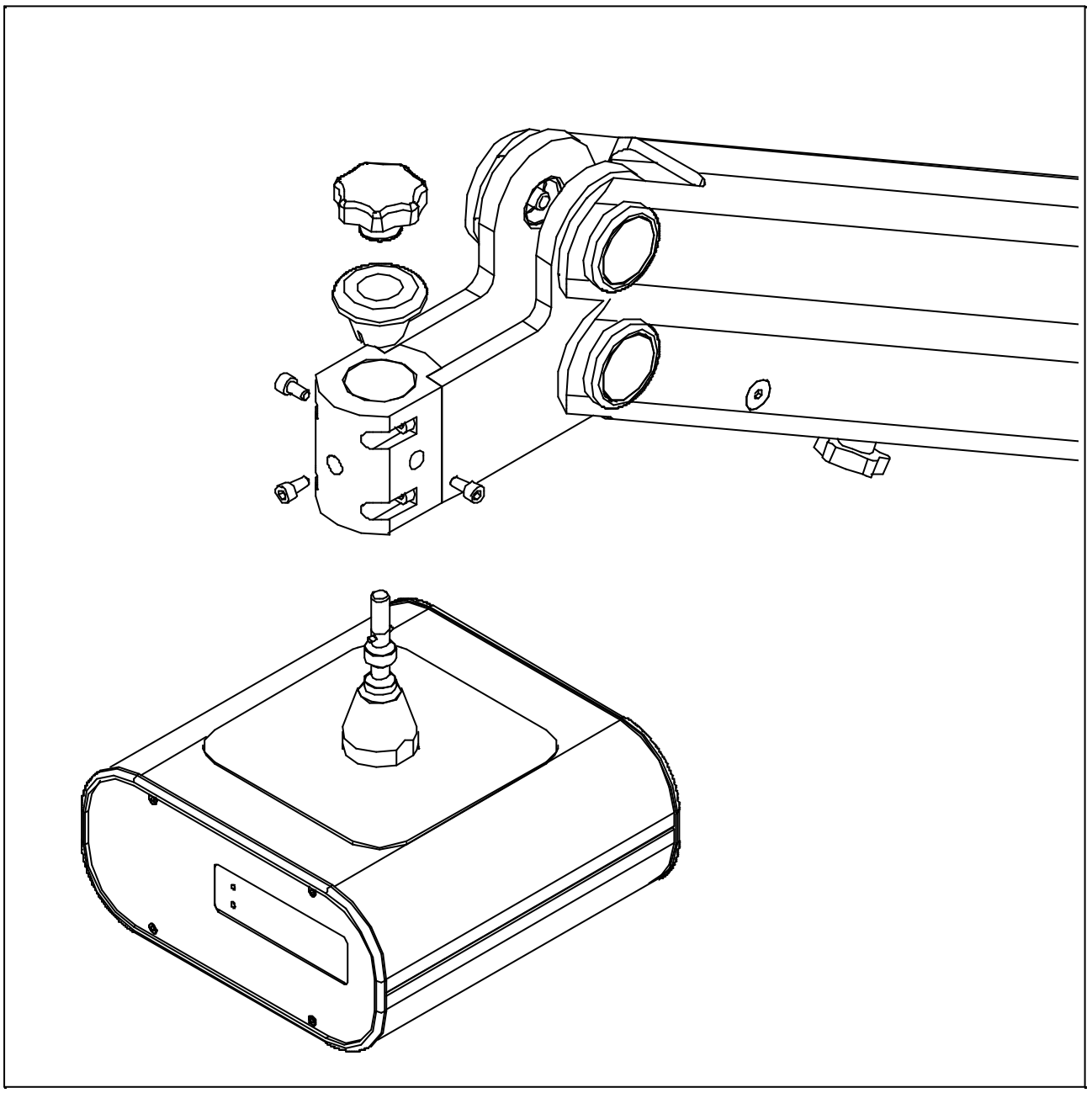

Figure A-8: Attaching the X-Y unit

Microscope head and suspension bracket: refer figure A-9

1. Identify and remove the microscope head assembly from the box. Attach the suspension bracket to the microscope so that the long arm of the bracket points upwards and the short arm points towards the eyepiece end of the microscope. Tighten the four M6 x 30 socket head cap screws evenly using the 5 mm socket key so that there is an equal gap on either side of the tilt adjuster. Check that the head assembly can now be safely lifted from the top end of the suspension bracket.

2. With the head assembly and bracket placed securely on a table or bench, manoeuvre the floor stand towards the table so that when the pantograph arm is lowered, the front of the X-Y unit faces towards the location of the microscope eyepieces. Lower the pantograph arm down so that the protrusion underneath the X-Y unit aligns with the shape of the suspension bracket, and that the 4 tapped holes on the underneath of the X-Y unit align with the 4 clearance holes on the suspension bracket. Fix the suspension bracket to the X-Y unit by screwing in the four M6 x 30 socket head cap screws from underneath. Tighten the screws evenly using the 5 mm socket key so that there is an equal gap on either side of the suspension bracket. Check that the head assembly can now be safely lifted by lifting the entire pantograph arm.

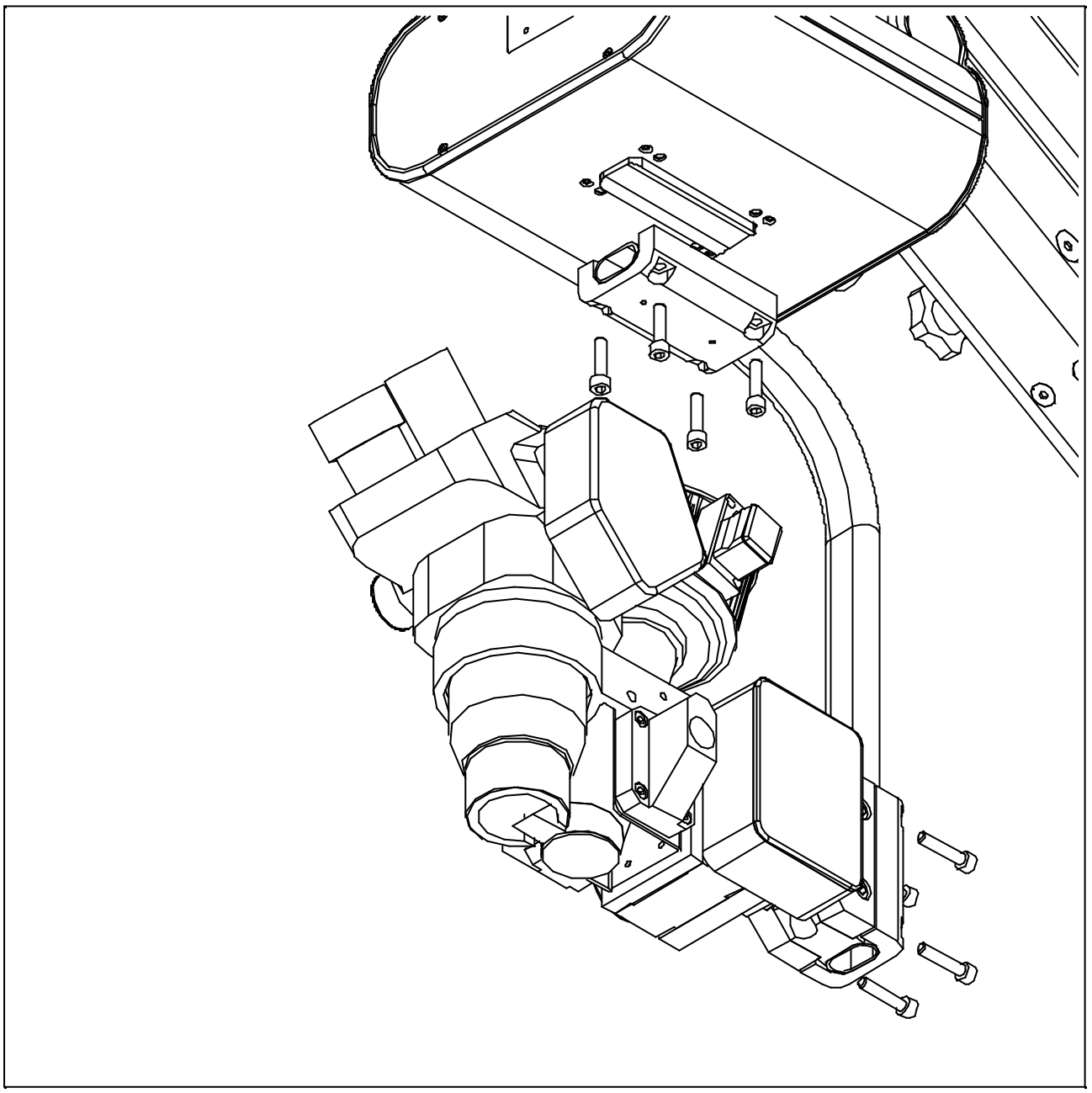

Figure A-9: Attaching the microscope head and suspension bracket

Eyepieces, handles and camera : refer figure A-10

1. Remove the eyepiece blanks from the microscope head and replace them with the eyepieces from the box. **Keep the eyepiece blanks in a safe place for later use.**

2. Identify and remove the microscope side handles and mounting bracket pins from the box. Insert the handles in the holes located on either side of the microscope head, ensuring that the transverse holes are located vertically. Secure the handles by inserting the locating pins.

3. Remove the black cap between the eyepieces and lamp house by loosening the side screws. **Keep the cap in a safe place for later use.** Fix the camera assembly in location by tightening the side screws again.

4. Note that the side handle and guide handle may be fitted with sterilisable covers. In addition the manual knobs for zoom and focus may also be fitted with sterilisable covers.

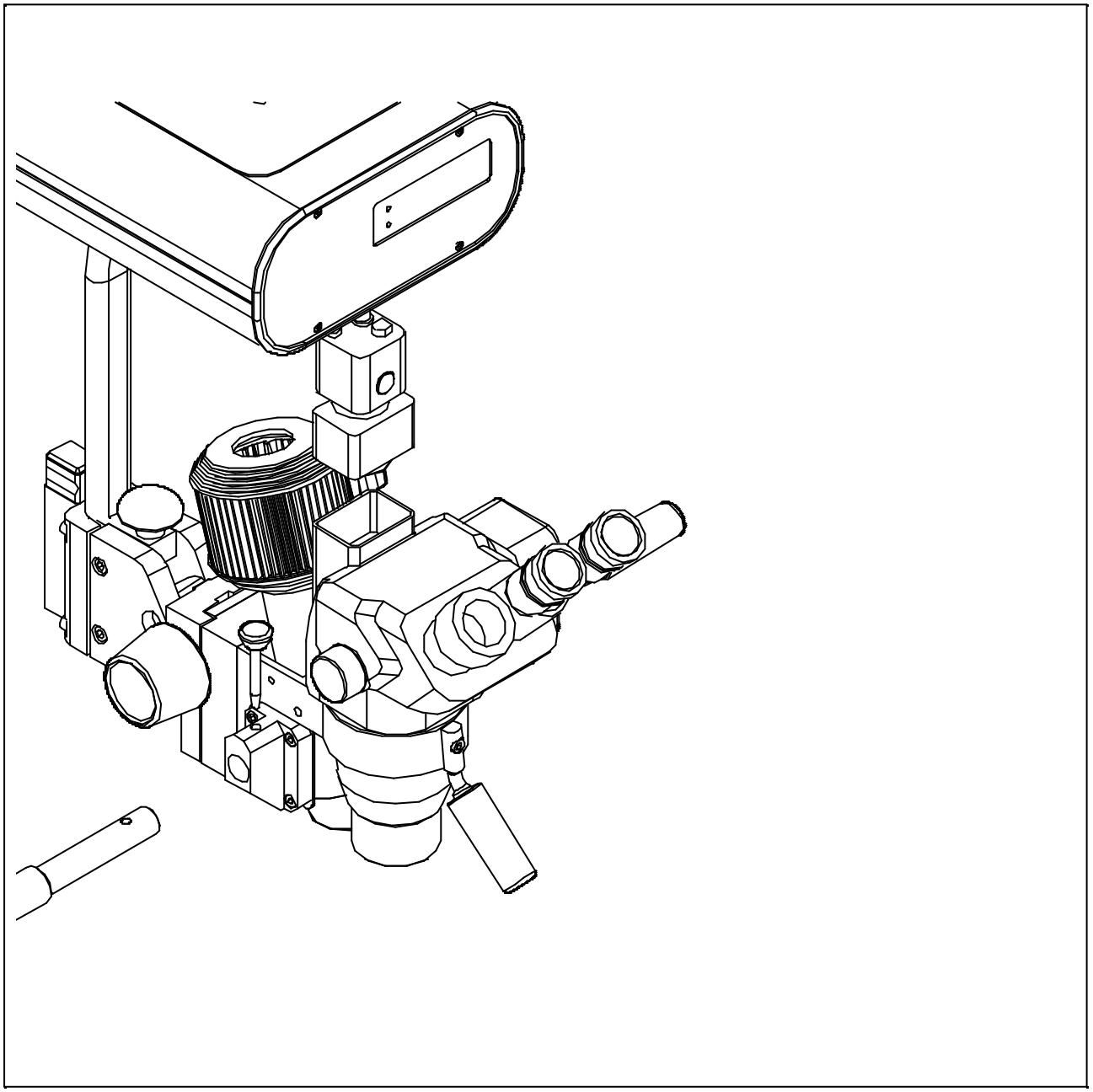

Figure A-10: Attaching eyepieces, handles and camera.

Monitor arm and bracket: refer figure A-11

1. Attach the monitor arm to the back of the pillar using the four M5 x 12 countersunk screws, and tighten using the 3 mm socket key provided.

2. Slide the monitor over the arm in the desired orientation. Tighten the bottom 2 screws on the black plastic tube adapter to set the friction and adjust the monitor angle as appropriate

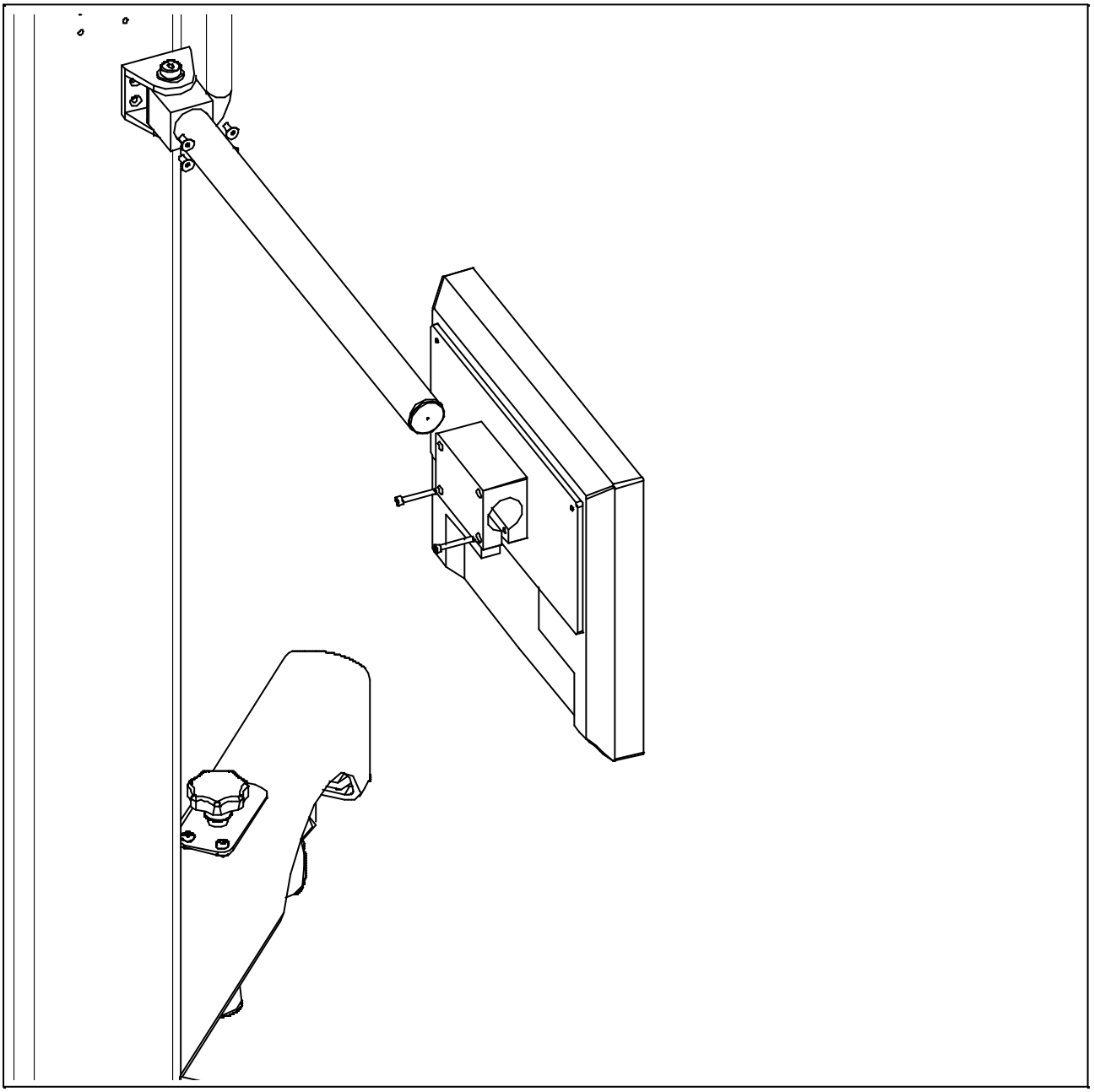

Figure A-11: Attaching the monitor arm and bracket

Binocular assistant microscope: refer figures A-12 and A-13

1. The binocular assistant microscope may be mounted on either side of the main microscope, and allows for non-coaxial viewing from a perspective 90° rotated from the image in the main microscope. The binocular assistant microscope must first be adjusted to suit the left or right side before it is mounted on that side of the microscope.

2. Hold the microscope in your hand so that the black knob above the rack and pinion system is closest, and the eyepieces are located on the other side of the rack and pinion system. A black horizontal fitting will then protrude either to the left or right side of the microscope head, with a silver shaft running transversely through the fitting..

3. If the black fitting protrudes to the left side, the microscope is set to fit on the left side of the main microscope. If the black fitting is on the right side the microscope is set to fit on the right side of the main microscope.

4. To insert the microscope in its fitting, first remove the appropriate side handle from the main microscope by removing the silver pin and sliding the handle out. Then insert the shaft of the binocular assistant microscope mount in the hole and insert the pin to secure it.

5. Focus the main microscope on a flat target.

6. Adjust the viewing angle of the binocular assistant microscope by loosening the side knob and tilting the assembly until the vertical centreline of the target is aligned horizontally in the binocular assistant microscope. Tighten the knob to secure the microscope in position.

7. If the target is already centred vertically in the binocular assistant microscope, no further adjustment will be required. To make a small adjustment for vertical alignment, the microscope may swivel about its tilted axis. To make an adjustment, loosen the top knob, swivel the microscope until the image is centred and tighten the top knob again.

8. The binocular assistant microscope may be focussed independently from the main microscope, but once in focus, it will remain in focus so long as the main microscope is focussed.

9. To swap the binocular assistant microscope fitting from left to right hand or vice versa:
   - Remove the microscope from its mounting hole on the side of the microscope
   - Loosen the top knob until the microscope may be rotated free of the retaining lip, then rotate it through a full 180°. Tighten the knob again.
   - Loosen the side knob until the horizontal fitting can be rotated free of the steel pins, then rotate it through a full 180°. Tighten the knob again.
   - The microscope is now ready to be mounted on the other side.

10. Note that the focussing handles on the binocular assistant microscope may be fitted with sterilisable covers. These are the same type as used on the manual zoom control on the main optical head.

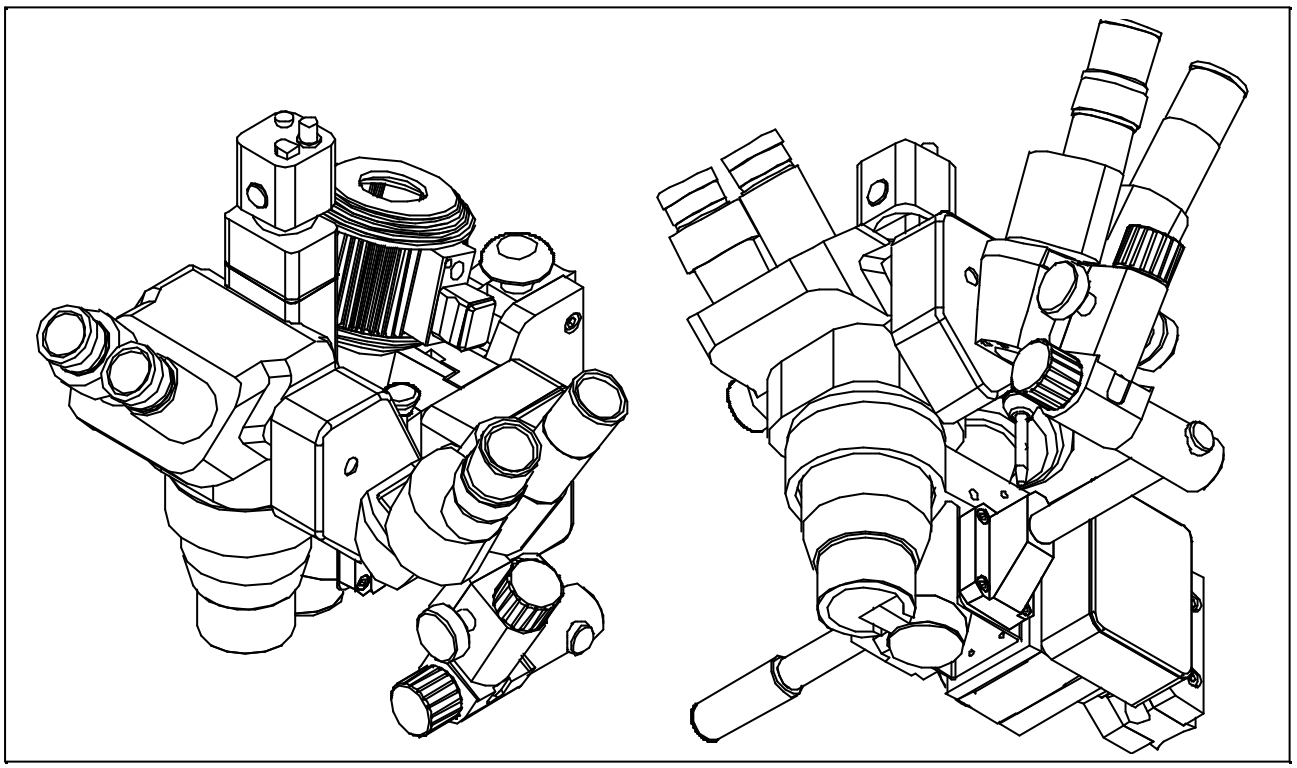

Figure A-12: Binocular assistant microscope in RHS orientation

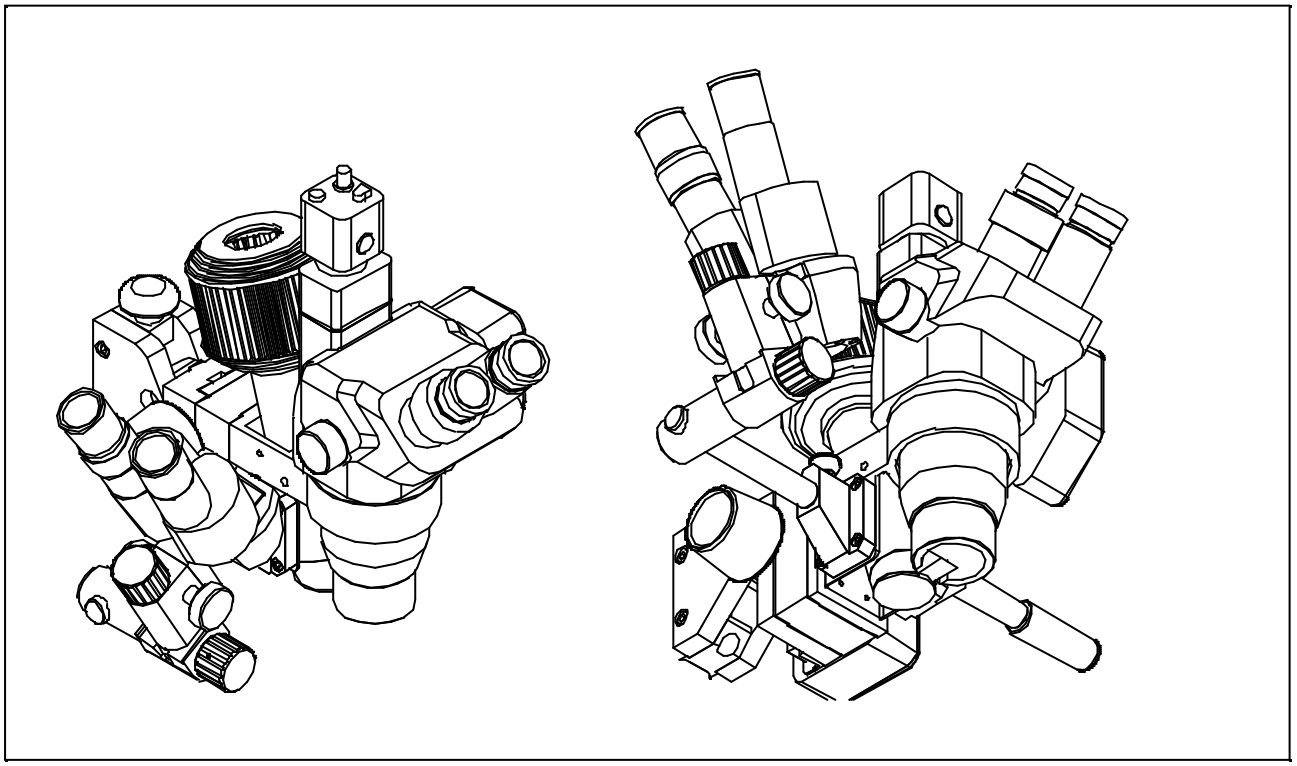

Figure A-13: Binocular assistant microscope in LHS orientation

CABLE AND POWER ASSEMBLY

1. Attach one end of the black main low voltage cable to the connector marked 'MICROSCOPE POWER OUT' on the panel on top of the horizontal arm. Attach the other end of the cable to the large connector marked 'MICROSCOPE POWER IN' on the back of the X-Y unit.

2. Attach the short black cable from the microscope head assembly to the small connector on the back of the X-Y unit labelled 'HEAD POWER'

3. Locate the short thin 12V power cable from the box, and attach it between the power input connector on the back of the camera, and the connector marked 'CAMERA 12V DC' located on the back of the X-Y unit.

4. Locate the longer thin 12V power cable from the box and attach it between the dc power input on the monitor and the connector marked 'MONITOR 12V DC' located the back of the pillar.

5. Attach the video signal cable between the camera 'VIDEO OUT' and monitor 'RCA IN', which is in between the 'A/V IN' and the 'AUX' markings. Use the clip on the right hand side of the X-Y unit to direct the cable exiting from the camera. Note that the video cable will already be routed inside the top section of the pantograph arm to keep it out of the way.

6. Locate the foot pedal from the box and place it on the floor next to the floor stand base. Attach the cable to the connector on the pillar lower panel.

7. Attach the mains IEC cable to the connector on the lower panel and plug into the mains supply. Use the wire cable retainer to avoid accidental plug removal.

8. Switch the microscope on from the main panel. Depress button 1 (its green LED will go OFF) then button 2 (its green LED will go ON), and set the light intensity as desired.

9. Check the operation of the foot switch for power zoom, power focus, and X-Y movement.

10. Adjust the speed of zoom/focus movement and X-Y movement as required using the knobs located on the main panel. Note that settings at the extreme low end of the range will be zero speed or speeds which are close to zero.

11. Check the return to centre function on the X-Y unit by placing a finger close to the detector window for 2 seconds. The switch operates when light is prevented from reaching an internal light detecting resistor, such as when obscured by a hand or finger. The sensitivity of the switch may be adjusted with a trim pot located inside the X-Y unit. The trim pot may be adjusted by rotating the knob marked 'RTC SENSITIVITY' on the back of the X-Y unit, using the small screwdriver provided. At one end of the range the switch is very sensitive and the X-Y unit will be in continuous return to centre mode, toggling between two minimally different positions. At the other end of the range, the switch is desensitised. The factory-set position is to avoid nuisance return to centre activation but the best position for the user will depend on the actual lighting conditions used.

MECHANICAL SETTINGS

1. The wheel locks are activated by applying foot pressure on the black knob and may be released by depressing the silver lever beneath the knob.

2. The horizontal arm may be rotated through some 300° and is locked using the knob located on the top of the main pillar (shoulder lock).

3. The pantograph can rotate some 270° relative to the horizontal arm and is locked using the knob located under the end of the horizontal arm (elbow lock). Note that if both elbow and shoulder locks are applied and a side force is applied to the end of the pantograph arm, the elbow lock will give way if sufficient force is applied. If a fixed angle between the horizontal and pantograph arm is required, the elbow lock will work best if the shoulder lock is not applied.

4. The gas spring which supports the pantograph arm may be adjusted for force by variation of the end position of the spring closest to the horizontal arm. By rotating the knob clockwise, the end of the gas spring is lowered which increases the amount of vertical force. Similarly, anticlockwise movement will increase the end position height and reduce the amount of vertical force. The factory setting should mean the arm is almost perfectly balanced in any position when the standard accessories are placed on the microscope head. By variation of the gas spring position, the pantograph arm may be set to always rise upwards, or to fall when released depending on an individual's preference.

5. The safety lock is designed to prevent accidental lowering of the pantograph arm and it may be set in any position as required. To use, unscrew the knob, then press the shaft in and move the slider to the desired position. To lock, screw the knob tight again. With the knob in position closest to the horizontal arm the pantograph arm will be unrestricted. When the knob is placed towards the X-Y unit, the downward movement of the arm will be restricted.

6. The pantograph arm may be locked in any vertical position using the side arm lock, or may be set to move when a particular frictional force is overcome.

7. Rotational movement above the X-Y unit may be adjusted by tightening or loosening the knob located above the bearing. Note that the presence of the

safety screws is required to prevent the X-Y unit and head from dropping if the knob is loosened completely.

8. The entire microscope head assembly can be tilted up some 5° (anticlockwise rotation) and down 45° (clockwise rotation) by adjustment of the black knob located behind the lamp house.